APPENDIX

WHAT IS CLAIMED IS:

1 and 4 to read as follows:

1. An optical system comprising an input optical fiber, an output optical fiber and a curved micro-electro-mechanical (MEMs) mirror Comprising:

a mirror layer for receiving light from the input fiber comprising a frame and at least one curved mirror comprising a metal-coated substrate movably coupled to the frame, the curved mirror having a maximum dimension less than 3000 micrometers and a radius of curvature less than 200 millimeters for reflecting and focusing light from the input fiber;

and an actuation layer disposed adjacent the mirror layer comprising at least one actuator coupled to the curved mirror for controllably tilting the curved mirror to direct the reflected light onto the optical output fiber.

2. The optical system of claim 1 wherein the actuator comprises an electromechanical actuator.

3. The optical system of claim 1 wherein the maximum dimension is less than 1000 micrometers and the radius of curvature is less than 80 millimeters.

4. An optical system comprising a curved mircro-electro-mechanical (MEMs) mirror comprising:

a mirror layer comprising a frame and at least one curved mirror movably coupled to the frame, the curved mirror having a maximum dimension less than 3000 micrometers and a radius of curvature less than 200 millimeters, and

an actuation layer disposed adjacent the mirror layer comprising at least one activator coupled to the curved mirror for controllably tilting the curved mirror, wherein the mirror layer comprises a metal-coated substrate, the substrate having a thickness in the range 0.1 - 40 micrometers and the metal coating having a thickness in the range 5 nanometers to 5 micrometers.

5. The optical system of claim 4 wherein the metal coating comprises a metal selected from the group consisting of gold, silver, rhodium, platinum, copper and aluminum.

6. The optical system of claim 4 wherein the substrate comprises silicon.

7. An optical system comprising a curved micro-electro-mechanical (MEMs) mirror comprising:

a mirror layer comprising a frame and at least one mirror movably coupled to the frame, the mirror having a maximum dimension less than 3000 micrometers and a radius of curvature less than 200 millimeters;

an actuation layer disposed adjacent the mirror layer comprising at least one actuator coupled to the mirror for controllably moving the mirror;

wherein the mirror layer comprises a metal-coated substrate having a pair of major surfaces, a thickness in the range 0.1 - 40 micrometers, and dopants implanted in

the region of one major surface in sufficient concentration to curve the mirror to a radius of curvature less than 200 millimeters;

and wherein the metal coating has a thickness in the range 5 nanometers to 5 micrometers.

8. The optical system of claim 4 wherein the metal coating and the substrate have coefficients of thermal expansion that differ by more than a factor of 2.

9. A method of making a device having a curved MEMs mirror comprising the steps of:

providing a device having a mirror substrate with a maximum dimension less than 3000 micrometers, and

implanting into the substrate in a surface region thereof, a sufficient concentration of dopants to curve at least a portion of the substrate to a radius of curvature less than 200 millimeters.

10. The method of claim 9 wherein the substrate is curved to a radius of curvature less than 200 millimeters.

11. The method of claim 9 wherein the implanting is by ion implanting at a dosage in the range 10^{13} - 10^{17} ions/cm^3.

12. A method of making a device having a curved MEMs mirror comprising the steps of:

providing a device having a mirror substrate with a first thickness maximum dimension of less than 40 micrometers and a first coefficient of thermal expansion;

coating the substrate with a coating of metal having a second thickness and a second coefficient of the thermal expansion;

and heat treating the coated substrate to a temperature in the range 100-600° C, the first and second coefficients and thicknesses and the heat treating temperature chosen to curve at least a portion of the coated substrate to a radius of curvature less than 200 millimeters.

13. The method of claim 12 wherein the substrate is curved to a radius of curvature less than 200 millimeters.

14. An optical system comprising:

a first optical fiber;

a second optical fiber; and

a curved micro-electro-mechanical (MEMs) mirror to direct light from the first optical fiber to the second optical fiber, the MEMs mirror comprising a frame and at least one mirror movably coupled to the frame, an actuation layer disposed adjacent the mirror layer comprising at least one actuator coupled to the mirror for controllably moving the mirror,

the mirror having a maximum dimension of less than 3000 micrometers and a radius of curvature less than 200 millimeters.

15. The system of claim 1 wherein the output location comprises an optical fiber.

16. The system of claim 1 wherein the output location comprises a second curved mirror.